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ARTICULATION OF OCCUPATIONAL EDUCATION IN CLACKAMAS COUNTY.

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ARTICULATION OF HIGH SCHOOL AND COMMUNITY COLLEGE OCCUPATIONAL PROGRAMS IN CLACKAMAS COUNTY WAS STUDIED FROM ASPECTS OF GUIDANCE, EXPLORATORY PREVOCATIONAL COURSES, AND VOCATIONAL COURSES. SOURCES OF DATA WERE INTERVIEWS WITH SCHOOL PERSONNEL AND EMPLOYERS, PLUS INFORMATION IN SEVERAL EARLIER STUDIES OF THE AREA'S EMPLOYMENT PATTERNS AND NEEDS. DUPLICATION AND OVERLAPPING OF PROGRAMS INDICATED THE NEED FOR A CONTINUING PROCESS OF ARTICULATION AND COORDINATION. VOCATIONAL PROGRAMS AT EACH LEVEL SHOULD BE ORGANIZED AROUND JOB CLUSTERS. IN COURSES WHICH ARE GIVEN AT BOTH LEVELS, STANDARDIZATION OF CONTENT WAS NEEDED. COOPERATIVE EFFORTS WERE NEEDED TO ELIMINATE COSTLY DUPLICATION OR GAPS BETWEEN PROGRAMS. SUGGESTED PROGRAMS FOR THE COLLEGE AND HIGH SCHOOL WERE LISTED. THE RECOMMENDATIONS EMPHASIZED THE NEED FOR FURTHER STUDY AND WORKSHOPS. (WO)



**ARTICULATION OF
OCCUPATIONAL EDUCATION
IN CLACKAMAS COUNTY**



***A Study of Vocational Education in High Schools
of Clackamas County and the Relationship to
Clackamas Community College Occupational Curriculums***



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ARTICULATION OF
OCCUPATIONAL EDUCATION
IN CLACKAMAS COUNTY

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Occupational Education

Clackamas Community College

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FOREWARD & ACKNOWLEDGEMENTS

Continual expansion of occupational (vocational-technical) programs in the high schools and community colleges without adequate consideration for overlap or duplication of courses is causing concern among educators and the tax paying public. This study was initiated by the Oregon State Department of Education, Vocational Education Division, and the Clackamas Community College to get a better understanding of the articulation problems in occupational programs and to determine what should be done to better articulate occupational programs in Clackamas County.

Dr. Roy G. Mikalson, President of Clackamas Community College, and Dr. William G. Loomis, Director of Vocational Education for the Oregon State Department of Education initiated the proposal for this study.

Dr. Ditto, Supt. of Oregon City Schools; Chester Tunnell, Supt. of West Linn Schools; Leo Crisman, Supt. of Molalla Schools; James Putnam, formerly Supt. of Colton Schools; Charles MacKenzie, Supt. of Canby Schools; Bob Crain, Director of Vocational Education of Milwaukie Occupational Skills Center; Al Pfahl, Director of Vocational Education, West Linn Public Schools, gave the initial support to introduce the study through cooperation of school districts in Clackamas County.

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The Oregon Apprenticeship Council, Portland Office, and Oregon State Employment Service, Portland Office, provided resource information.

Research resource material was provided by Dr. T. Antoinette Ryan of the Oregon State University Research Coordinating Unit and Ronald Kaiser of the State Department of Education.

The final report was reviewed by Dr. Mikalson, President, and Dr. John Hakanson, Dean of Instruction, of Clackamas Community College.

Gilbert R. Bloomquist, Assoc. Dean of Occupational Education, Clackamas Community College, Project Director.

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Section One

INTRODUCTION

The Problem: How can more effective articulation of high school and post high school occupational education be realized?

Problems--multiplicity of problems--these are compounded in our rapidly changing world. Scientific discovery with its resultant technological developments presents an almost insurmountable job in occupational education.

Changing occupations and totally new occupations require constant restructuring of occupational education to prepare our students for employment. Knowledge and skills required for performance on a particular job today may be considerably changed a year from now due to technological change. To prepare a student for a particular occupation today from junior high through secondary school and community college involves consideration for change. Provision for adjustment to change in occupational demands must be built into occupational education curriculums.

Education and training for families of jobs in occupational clusters will more adequately provide for this change. General background education and skill training common to a group of occupations will allow for changing job demands. As an example, we find that in the electronic industry many new inventions and utilization of electronic devices and equipment have brought about changing job demands.

The major problem confronting education is to provide for on-going articulation of occupational education from the exploratory courses in junior high or ninth and tenth grades, to occupational preparation for an occupational cluster in the eleventh and twelfth grades, to a more specialized occupational education in the community college and/or apprenticeship or in proprietary schools.

The key problem to this study is:

HOW TO ARTICULATE OCCUPATIONAL EDUCATION BETWEEN THE HIGH SCHOOL AND THE COMMUNITY COLLEGE IN CLACKAMAS COUNTY.

Educators are individualists and as such, are prone to take off in many directions with much to be desired in the articulation of their efforts. To articulate occupational education between the high school and community college consideration must be given to:

1. How can guidance personnel contribute to better articulation in occupational education?
2. How can exploratory pre-vocational courses be articulated in occupational education?
3. How can vocational courses in the high schools be articulated with the post high school occupational programs?

What are the functions of education counselors in the articulation of high and post high school occupational education? Varying viewpoints have been expressed by authorities regarding the responsibility of counselors in guiding students toward occupational (vocational) careers. Some authorities recommend separate counseling for guidance leading to baccalaureate degrees as differentiated from vocational or job guidance.

Because of budget limitation, many schools do not provide for counselors specializing in only the college preparation or vocational goals. Most schools find it necessary to expect counselors to provide educational guidance for college or university careers and vocational fields.

The question usually raised is whether a counselor can be adequately prepared to guide students in both areas. An academically trained person has the background by educational experience and professional training to provide academic guidance. Doubts are expressed as to whether or not a counselor can adequately guide students in vocational or job-oriented goals if he has not had practical experience in jobs requiring less than a professional degree.

The first question to consider is: What are the responsibilities of the counselor for occupational guidance as differentiated from academic or college preparation guidance? Too often vocational guidance is given second consideration with guidance for college preparation getting the major emphasis. The usual plan of our "required" courses in high schools is for college preparation. This is historic. The original purpose of secondary or "prep" schools was college preparation. As a consequence, vocational guidance and planning can become no plan and something a student "drops down to" if he can't make the college prep.

When vocational guidance is provided at the end of high schooling, it comes too late. "Limitations inherent in eleventh hour vocational guidance (contemptuously termed "crises counseling" by Super (1957) can be avoided only by bringing professional influences to bear on the choice

process many years before the necessity for choice arises (thereby avoiding crises) and by insisting that vocational considerations are not neglected where educational decisions are made."¹

The second question to consider: Is a planned vocational guidance program in operation to assist every student in selecting a career field on the basis of interests and aptitudes shown in pre-vocational exploratory courses? Guidance and occupational information must be provided to help the student make the best vocational choice. Again, we often find the academic plan of providing reading material for vocational information inadequate.

Studies and practical experience have shown that parental direction and bias are of considerable importance in a student's choice of a vocational field beyond his personal interests and aptitudes. The attitudes of the parents toward a job and the status it represents often determine the career choice. Dawes points out that "The educational vocational counselor, also, should work occasionally with the student's parents, particularly if he felt that their influence on the child's vocational thinking was misguided."²

There is no substitution for experiencing the work involved in a job to provide better career selection. Pre-vocational exploratory courses or job orientation or work experience in business or industry will resolve vocational career choices when other means fail. Direct information from

¹Dawes, Peter P., What Will the School Counselor Do, Educational Research, Vol. 9, No. 2, Feb. 1967, pp. 90-91.

²Ibid.

employed persons in business and industry provides some of our most meaningful information for students. The "Youth Town" experience as provided Danish youth after they reach the age of fourteen is a good example of a more realistic method of offering the student an opportunity to get a better look and feel of jobs in business and industry.³

The third question to consider: Is provision made for personal contact by the student with a successful person in the occupation before planning a vocational program? After a career goal has been selected is a definite plan developed for the student to articulate high school vocational education with the career goal? Again we find that students are given a choice of varied exploratory or vocational courses as a "fill in" with no intent of articulation with post high school education or training.

The fourth question: Is a written vocational study and training program planned after careful guidance and selection of a vocational career objective? Vocational education which can be offered in the high school is naturally limited because of costs and time required. Therefore, it follows that articulation should be made with post high school institutions or on-the-job training plan to successfully place the student on the job for which he is preparing.

The fifth question: Is a definite occupational education program planned for each student beyond high school?

³Sedlacek, Franz, Danish Youth Town: Practical Vocational Orientation, Oregon Education Journal, Vol. 41, No. 16, May 1967.

How are the exploratory and pre-vocational courses articulated in occupational education? It is basic to articulation of occupational education between the high school and post high school that adequate experiences in exploratory courses be made available in high school. Courses in agriculture, industrial arts, home economics, secretarial and business which are not particularly oriented to placement on a job are the usual exploratory areas. It is essential that the student taking exploratory courses should have the opportunity to try more than one occupational related exploratory courses. Such exploratory experiences should give a basis for determining interest and perhaps aptitudes in an occupational cluster. When the occupational cluster has been determined, is a planned program of education developed for the student in courses that are related and concentrated in the cluster? Is consideration given to articulation of these courses within the occupational cluster in the high school, and/or post high school education in a planned program of study?

How can vocational courses in the high schools be articulated with the post high school occupational programs? Vocational courses offered in high school are often established without consideration of need or the possible duplication in an apprenticeship, vocational school, community college or private school. Articulation with existing programs in other institutions should be a preliminary step to the addition of vocational courses or programs. In like manner, the post high school institutions should take into consideration existing vocational courses which are established to meet local employment needs.

Obviously, duplicate courses may be offered in some subjects where the need exists in both high school and adult levels. An example would be typing. Many persons who need such a skill in their jobs have not taken the course in high school and later, as employed persons, find that it is necessary. Likewise, a person who enters training in an engineering technician field might possibly not have taken basic drafting in high school. In such cases the basic drafting fundamentals would need to be offered both in high school and post high school.

Not only should careful consideration be given to the articulation of vocational courses in high school and post high school, but consideration should be given to articulation of mathematics and science courses in high school which are pre-requisite to post high school occupational programs. Post high school programs such as electronic engineering technology, civil engineering technology and the like, should be articulated with preparatory mathematics and science courses in high school.

On-the-job training and apprenticeships which would be taken following high school graduation should be articulated with skill training and basic preparatory science and mathematics courses in high school. In some apprenticeships such preparation may need to be articulated between the high school, community college and apprenticeship or an in-plant or on-the-job training program.

The basic problem to consider is--How can better articulation be accomplished between the high school and post high school education and training facilities in the planning of vocational programs?

Methods and Limitations of This Study.

1. Area and Grade Levels

To identify the problems of articulation of occupational education in the high school and community college or post high school levels in Clackamas County, interviews have been made with the high school personnel in the area served by Clackamas Community College to determine the extent of pre-vocational or exploratory courses and vocational courses offered and planned for the future in the high schools of Clackamas County. These interviews did not include the junior high schools which in many instances provide pre-vocational or exploratory courses. Some consideration was given to the junior high pre-vocational courses where the junior high grades, particularly the ninth, were a part of the high school.

The area of the County considered in this Study is only that part of Clackamas County included in the boundaries of Clackamas Community College District. This excludes the Lake Oswego and Sandy High Schools. The Catholic LaSalle High School was included with the public high schools.

2. Sources of Data

Information on employment needs in various occupational clusters for which the articulation is concerned was obtained from the Oregon State Dept. of Employment Study published in November, 1966. The section relating to the Greater Portland Area is used as a basis of determining occupational employment by cluster. This area was considered due to the fact that a great number of persons living in Clackamas County work in the Portland metropolitan center. An analysis of the location of employment of apprentices living in Clackamas County verified the fact that the majority work in the city limits of Portland.

The Clackamas Study of 1965 has also been used as a source of information relating to vocational education needs as shown in Clackamas County.

The Job Cluster Study of Lane County (1965) and the Oregon State Dept. of Education's Guide to Structure and Articulation of Occupational Education Programs have been used as a basis for the identity of clusters. The finalized occupational clusters to be considered in this study are a composite of these studies, existing groupings offered in the Clackamas County High Schools, and the

projected curriculum offerings to be given at Clackamas Community College.

The basic information to be used to arrive at conclusions and recommendations for better articulation was obtained by personal interview with persons involved with vocational curriculums at the various high schools included in the Study. An attempt was made to include the superintendent, principal, vocational director, director of guidance and curriculum director in each of the interviews where feasible. In some instances this was not possible and as a consequence some of the information may be incomplete and not accurately identified.

It is obvious that there would be differences of opinion between persons at various schools about the identification of courses that would be classed as exploratory or vocational. The determination as to whether or not a course would be considered as vocational was on the basis of whether or not it would lead to employment because of knowledge and skills learned in the course. Employability because of courses offered was determined by the person interviewed. The person interviewed also determined whether the course was pre-vocational or college preparatory.

Identification of courses to be added in the next five to ten years was in many instances on the basis of, "I think so, if we get the needed budget money."

Course outlines for high school pre-vocational and vocational courses were requested, but very few were obtained. Analysis of course content would have been valuable to determine coverage in relation to the community college courses. Such an analysis would determine where articulation can be made and where some changes would need to be made.

3. Definition of terms

Distributive Education--Education directed toward jobs in marketing or merchandising of goods or services. These jobs may be found either in the retailing, wholesaling, manufacturing, transportation and financial businesses.

Entry job--The beginning job in a career occupation, usually related to a job which takes a minimum of preliminary education or skill training. Additional training would usually be necessary on the job after employment.

Exploratory or pre-vocational course--Course which provides some related practical experience that may develop interest in an occupational field.

Industrial arts--Courses involved in basic manipulative work such as woodworking, machine work, drafting, which are not specifically oriented toward job entry. These courses are essentially exploratory in nature.

Job cluster--A grouping of jobs which have common basic knowledge and skills. An example would be the mechanic cluster which could include auto mechanic, tractor mechanic, diesel mechanic, etc.

Occupational curriculum--A grouping of courses required for completion of a program of studies to qualify a person for a specific occupation.

On-the-Job training--Practical work experience in business or industry with supervised training for a specific occupation. Usually related and general school courses are planned as part of the total occupational education and training program.

Technical education--Education including technical information, and understanding principles of science and technology as applied to modern design, production and distribution. Knowledge of the technical field with ability to solve technical problems involving more than technical skills is included in a technical curriculum.

Vocational--Insofar as this study is concerned, vocational relates to subject matter and skill training for jobs which are basically skilled or semi-skilled in manipulative work such as typing, operating or repairing machines, selling, storing, packing, etc.

Changing Concepts and Demand for Occupational Education

Since the passage of the Vocational Education Act of 1963, many studies have been made on national, state and local levels to determine where vocational education is needed and to identify the occupational fields for which education and training are needed. Needless to say, these studies have supported the findings of the President's Consultants on Vocational Education (1962) which pointed out the need for expansion of vocational education in secondary and post high schools and the inclusion of occupational training which had not previously been provided. Previous to the passage of the Vocational Act of 1963, vocational education had become somewhat stereotyped and limited to narrowed programs within such confines as agriculture education, trade and industrial education, distributive education, homemaking and some limited health fields.

The rapid changes in technology, mobility of our population, urbanization, and population explosion have forced us to re-examine education for work. Margaret Mead, the anthropologist, pointed out that: "The most vivid truth of our age is that no one will live all his life in the world into which he was born, and no one will die in the world in which he

worked in his maturity."⁴

It is becoming increasingly apparent that our young people will need to have a rising general education level and increasing skill competence to meet the challenge of change. Also it is evident that education and training for the world of work will require continual processes of retraining during the life span of the individual.

In the past there has been a distinct division between general education and vocational education. We have become more aware of the dependence of vocational education on general education such as "language and arithmetic skill and basic knowledge of the world about us."⁵ There are other factors of our education which need attention such as cultural and personality development. "The teaching of skills in job performance is of minor importance when compared to the development of an adequate personality. 95% of job failures can be attributed to inadequacies in personality development.....When two men with equal job capabilities are being considered for promotion, the one with the pleasing personality usually wins."⁶

With the many and varied new jobs developing in this technological age it is essential that programs of vocational education be planned for an ever-widening range of occupations. Flexibility of planning of the

⁴Mead, Margaret, Education for a Changing World of Work, Report of the Panel of Consultants on Vocational Education, U. S. Govt.

⁵Ibid., P. 264.

⁶Wright, Stanley A., Patterns for Secondary Schools, Is Separate Education for Vocational Educational Students the Answer?, The Balance Sheet, Vol. 47, No. 9, May, 1966, pp. 398-399.

curriculum structure must be maintained to meet the changing demands of our society. To be more specific, the education and training given in the auto mechanics program of recent years might be drastically changed with the advent of gas turbine engines and electrically powered automobiles. In like manner, in business education where data processing has become an important part of the business field, the accent in education and training will need to be restructured to meet the new systems of accounting and record keeping.

Occupational Opportunities Present and Projected in the Greater Portland Area

Occupational education planning in Clackamas County must take into consideration the employment opportunities in the Greater Portland metropolitan area as many employed person living in Clackamas County are employed in the Greater Portland Area. The study of the Oregon State Dept. of Employment of November, 1966 is used as a basis of determining the required needs. This study included Clackamas, Multnomah and Washington counties in the Greater Portland Area.

In planning for better articulation of high school and post high school occupational education, employment opportunities should be given first consideration. To plan for articulation where all high schools would feed into a community college curriculum and where limited employment or work is available, would be misleading to our young people. Also in some curriculums the high schools and community college may be training for the same entry job without consideration of job needs.

To better view this relationship, the added occupational needs in the Greater Portland Area will be shown by job families or job clusters. Articulation of education and training will be presented in job clusters as the training for similar jobs in a cluster involves education and training common to all jobs in the cluster. Only jobs requiring less than a baccalaureate degree but requiring special occupational education will be considered. (Note Tables 1 through 12)

Table 1

AGRICULTURAL OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Agricultural Service	1,470	225
(This study does not include self-employed farmers, and separation of mechanics, sales and service jobs related to agriculture.)		

Table 2

BUSINESS (MARKETING AND DISTRIBUTIVE) OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Shipping & Receiving Clerks	1,833	380
Stock Clerks & Storekeepers	1,642	219
Sales Clerks, Counter	4,360	751
Salesman, Insurance	1,808	553
Salesman, Real Estate	853	202
Salesman, Specialty	7,777	1,706
Salesman to Consumer	2,179	366
Salesman, Other	7,410	2,578
Other Sales Jobs	1,961	443
Checkers	2,005	340
Transportation, Communication, & Utilities	4,936	451

Table 3

CONSTRUCTION OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Construction Occupations (Semi-skilled)	1,419	145
Construction Occupations (Skilled)	10,627	1,458
Drilling & Blasting	105	28
Stationary Portable & Hoisting Engineers	1,058	102
Surveyor	461	41

Table 4

ELECTRICAL--ELECTRONIC OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs To 1969</u>
Electronic Technician	1,292	104
Radio Operators	133	22

(Maintenance, construction and service electrician not included as these are included under other categories.)

Table 5

FOOD SERVICE OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Cooks	3,852	490
Food Processing	984	131
Food Servers	7,067	847
Kitchen Helpers	4,464	529

Table 6

HEALTH OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Medical Personal Service	4,588	770
Medical Technicians	1,853	243
Registered Nurses	4,530	640

Table 7

MECHANICAL OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Automotive Truck & Bus Mechanics	4,954	897
Millwrights & Repairmen	6,496	633

Table 8

METAL WORKING OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Lab Assistants	500	50
Metal Working (Skilled Machinist, Tool & Die Makers, Structural Steel, Boilermakers, etc.)	9,256	1,507
Metal Working (Semi-skilled such as Machine Operators, Chippers, Burners, etc.)	8,095	1,530

Table 9

GRAPHICS OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Draftsman	1,614	347
Printing (Skilled)	2,119	566
Printing (Semi-skilled)	168	42

Table 10

OFFICE OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Accounting Clerks & Cashiers	4,028	528
Bank Tellers	1,102	218
Bookkeepers	6,233	733
Clerk, General	2,704	448
Clerk, General Office	7,721	1,178
Clerk, Direct Service	325	56
Credit Clerk	621	109
Office Machine Operators	2,577	507
Personnel Clerks	283	64
Receptionists	1,064	188
Secretary & Stenographer	8,593	1,442
Typist & Clerk-Typist	4,487	753

Table 11

WOOD PRODUCTS OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Lumber & Wood Products Mfg. (Semi-skilled)	3,518	188
Lumber Production (Skilled)	1,890	154
Pulp & Paper Production (Semi-skilled)	720	38
Pulp & Paper Production (Skilled)	303	19

Table 12

GOVERNMENT SERVICE OCCUPATIONS IN GREATER PORTLAND AREA

	<u>1966 Employment</u>	<u>Added Needs to 1969</u>
Firemen	1,393	293
Law Officers	1,854	274
Personnel Technicians	250	63
Postal Service	2,997	445

Demand for qualified personnel as shown in the previous tables indicates need for occupational education for a variety of jobs. Education and training for these jobs will be provided by high schools, proprietary schools, community colleges and apprenticeship in the Greater Portland Area. This calls for cooperative planning between the various agencies and private schools and articulation between the high schools and post high school levels of occupational education.

Findings of the Vocational-Technical Education Study in Clackamas County

This study began in June, 1965 and was completed in August, 1965. The present articulation study is a follow-up to the 1965 study. Vocational programs have been added in the high schools since this study was completed. Other programs are being planned. Clackamas Community College began offering occupational education in 1966-67. The 1965 study pointed out vocational courses and course content that should be provided in Clackamas County.

The next logical step in the development of vocational programs is an orderly planning and articulation of programs in the Clackamas Community College and the high schools. Clackamas Community College was not in existence during the 1965 study and as a consequence, that study was not concerned with the articulation of vocational (sic, occupational programs) programs in the Community College.

The 1965 study pointed out the need for expansion of vocational education in the high schools of Clackamas County. This study was made to determine:

1. Were high school graduates adequately prepared for employment?

2. Would vocational education increase the percent of high school students completing high school?
3. What vocational education was being given for employment?
4. What added education needed to be given to prepare a high school student for employment?
5. How could education for employment be achieved?

The 1965 Study provided the following information:

1. The requirements for various jobs in Clackamas County.
2. The number employed in various occupational groups.
3. The opinions as expressed by employers for and against vocational education in high schools.
4. The suggestions by people in business and industry regarding vocational subjects that should be provided in high school.
5. The general attitude of business and industry toward apprenticeships and work-study programs.
6. The vocational subjects being given in high schools.

From analysis of the Clackamas (1965) Study it is obvious that the consensus of opinion among employers was one that favors expansion of vocational education in high schools. Employers suggested innumerable subjects which should be provided young people before entering employment. Some of the subject areas suggested were beyond the capacity of the usual high school. Many suggested subjects could be more adequately provided in the community college. To give an example, advanced accounting, as suggested in this Study, would be beyond the usual range and possibilities of the high school curriculums. Also, a general data processing study and practice would not be feasible in

most of the high schools because of the expense and the advanced nature of this type of program.

Other occupational fields for which a need for training was suggested by the employer groups were engineering aide, technician and surveyor's assistant. These programs are usually of a post high school level due to the preliminary courses in mathematics and science which must be provided in the high school before entering such programs. Practical nursing, another suggested training area, is a program which involves extensive work experience within the hospital and could more adequately be provided after the completion of high school courses. Subject fields such as police training, fireman training, electronics technology, real estate selling, heavy equipment operation, and many others included in the suggestions, could be more adequately given on the community college level.

It is evident from an analysis of the 1965 Study that careful study and planning of the articulation of occupational training programs between the high schools and the community college is essential. The 1965 Study pointed out that high school training in occupational skills and technical education would be valuable to a young person before entering an apprenticeship. Such education would likewise apply to many programs offered in the community college occupational education. Careful articulation would need to be made between the high school and community college and/or the high school, community college and apprenticeship. An example of such articulation would be in the area of machinist training where considerable on-the-job experience

is required in some industries for adequate performance. In such instances the basic exploratory courses and some limited machine shop training would be given in the high school with more intensive application in the community college, followed by application of the knowledge gained in an apprenticeship.

Basic skills and knowledge required for employment in various fields suggested a need for coordination in the planning of curriculums between the high school and post high school to prevent duplication of education and training. The 1965 Study pointed out that the following skills and/or knowledge were essential for a person entering the construction industry: basic mechanical principles; operation of dozers, graders, etc.; industrial safety; utilization of common tools; welding and cutting methods; blueprint reading; slide rule; knowledge of high pressure or hydraulic systems. Obviously many of these learning experiences might be given in the high school or community college or more narrowly limited to one level. Planning should be jointly considered by the high school and post high school curriculum planners. In like manner, various processes, operations and knowledge were indicated as necessary for employment in manufacturing industries, wholesale distribution field, trade fields, retail trade, transportation, finance, services, and government. These functions need to be identified by the high school and college in cooperative planning so as to effectively articulate occupational education.

Occupational Education Clusters in High Schools

Occupations for which job entry or college preparatory training can be

given in high schools may be grouped in families or job clusters. These clusters are those which have much in common insofar as basic information and skills are concerned. To give an example, mechanical jobs such as auto mechanics, diesel mechanics, machinery mechanics, and maintenance mechanics have much in common. Basic information regarding internal combustion, levers, gears, etc. are similar. Skills of machining, welding and trouble shooting analysis have a commonality among these occupations.

The Oregon State Department of Education, Division of Vocational Education and Community Colleges made a study of these clusters and suggested the following: *

- | | |
|---|---------------------------|
| 1. Mechanical | 5. Food Service |
| 2. Office Occupations
(Including Clerical,
Stenographic and
Accounting | 6. Construction |
| 3. Marketing | 7. Wood Products |
| 4. Agricultural | 8. Metal Working |
| | 9. Health |
| | 10. Electrical-Electronic |

In this Study graphics has been added to include the many jobs represented in the printing, drafting fields, and commercial art.

The occupational clusters which were studied in the high schools of Clackamas County were:

- | | |
|---|---|
| 1. Agricultural | 8. Metal Working |
| 2. Business (Marketing
& Distribution) | 9. Office Occupations
(Secretarial, Book-
keeping & Clerical) |
| 3. Construction | 10. Wood Products |
| 4. Electrical-Electronic | 11. Graphics |
| 5. Food Service | |
| 6. Health | |
| 7. Mechanical | |

*Oregon State Department of Education, Division of Community Colleges and Vocational Education, Guide to Structure and Articulation of Occupational Education Programs, Supt. of Public Instruction Salem, Oregon, 1967.

Occupational or vocational education, as identified for federal and state re-imbursement are those courses which provide specific education and/or training for direct job entry. Some courses offered as vocational courses may also be considered as exploratory or preparatory for a more intensive program of study in the community college or on-the-job training.

No attempt will be made in this Study to judge whether a course should be considered exploratory or vocational. In many courses this can only be determined by the results obtained by the student. Some may find it useful only as an exploratory course or preparation for apprenticeship or community college education. Others may find the course helpful for direct job entry.

The State Department of Education identified occupational courses as "those courses which include common skills, knowledge, concepts and principles identified by analysis of the occupation for which the course prepares the student."⁷ Courses for occupational education must provide a "minimum of ten hours per week to provide the intensive and extensive instruction necessary for effective entry occupational performance."⁸

⁷Oregon State Dept. of Education, Div. Community Colleges & Vocational Education, Guide to Structure and Articulation of Occupational Education Programs, Supt. of Public Instruction, Salem, Oregon, 1967.

⁸Ibid.

Chart I

CLUSTERED GROUPS OF OCCUPATIONAL COURSES SUGGESTED BY STATE DEPT. OF EDUCATION FOR SECONDARY SCHOOLS

Mechanical Cluster

Industrial Mechanical Practices & Machines	Power Transmission & Mechanical Linkage
Internal Combustion Engines	Basic Electricity
Hydraulics & Pneumatics	Industrial Science
	Blueprint Reading & Sketching
	Welding Fundamentals

Office Cluster

Typewriting II	Business Economics
Business Machines	Data Processing
Bookkeeping I & II	Shorthand I & II
Business Mathematics	Business Organization & Management
Business Law	Clerical Practices
Business English	Secretarial Practices

Marketing Cluster

Marketing I & II	Business Math
Business Speech	Business English
Advertising Lab	Business Law
Commercial Art	Employment Lab

Agriculture

Agricultural Science	Internal Combustion Engines
Landscape Horticulture	Hydraulics & Pneumatics
Forestry	Basic Marketing
Farm Operation & Management	Business Economics
Agricultural Mechanics	Welding
Bookkeeping I	Drafting & Sketching
	Basic Mechanics

Food Service

Health Sanitation & Safety	Nutrition & Menu Planning
Preparation for Employment	General Business Procedure

Related to Food Service

Introduction to Food Service	Quantity Food Service
Food Service Knowledge & Skills	Quantity Food Preparation

Chart I (Cont.)

Construction Cluster

Architectural Drawing & Planning	Building Materials & Construction
Blueprint Reading & Sketching	Procedures--Wood, Masonry
Construction Accounting & Computing	Structural & Interior Building
Welding Fundamentals	Materials & Procedures
Fundamentals of Building Construction	Advanced Construction Techniques

Wood Products Cluster

The Forest Industry	Blueprint Reading & Sketching
Logging Practices & Basic Wood Products	Industrial Science
Finished Wood Materials	Industrial Maintenance Practices &
Advanced Wood Processes & Materials	Machines
	Welding Fundamentals

Metal Working Cluster

Basic Metalworking Practices & Machines	Basic Electricity
Machining & Forming Techniques	Industrial Science
Materials & Metal Processing	Blueprint Reading & Sketching
Fabrication Methods & Production Tech.	Welding Fundamentals

Health Cluster

Body Structure & Function	Health Service Skills I
Microbes & Disease	Patient Relations
Employer-Employee Relations	Health Service Skills

Electricity-Electronics Cluster

DC Circuit Principles & Analysis	Basic Metal Working Practices & Machines
AC Circuit Principles & Analysis	Industrial Science
Electron Tubes & Solid State Devices	Blueprint Reading & Sketching
Industrial Controls & Instruments	Welding Fundamentals

Graphics Cluster

Blueprint Reading & Sketching	Graphic Art
Architectural Drawing & Planning	Printing
Commercial Art	Photography

The courses as suggested by clusters are being offered in some high schools under other title. The aforementioned courses are only suggestions and do not limit courses which might be offered as occupational courses.

Occupational Programs in the Community College

Programs offered in the community college are often a continuation of courses begun in the high schools such as machine technology and secretarial science. Other programs such as engineering technician curriculum are built on preparatory course work in the mathematics and science courses given in high school.

Many of the beginning courses given in the general vocational programs such as typing or shorthand in secretarial programs will begin at the same level as the high school courses. This duplication of courses is provided to make it possible for a student to take the beginning courses in the community college if he has not had the course in high school.

The length of pre-employment education and training varies with programs. A program in home health aide may last from six to eight weeks; welding technology may run three quarters; practical nursing may extend into four quarters; and engineering technologies may operate full time from six to eight quarters.

Many courses offered in the community college are common to many curriculums in the occupational cluster. As an example, basic electrical theory and a common foundation in mathematics would be given in all curriculums in the electricity-electronic cluster. Students in the electronic engineering technician curriculum would be scheduled through a higher level of technical mathematics and electricity-electronic theory.

A selected group of general education courses are usually included in a

community college curriculum. Such a group can represent eighteen to twenty-five credits in a two-year program and can include communication skills, American institutions, personal health, physical education, and others.

Job clusters for which high school vocational-technical courses are planned will usually lead to more specialized programs in post high school institutions. Some of the typical programs which the high school student may progress to are suggested by the following chart:

Chart II

TYPICAL PROGRAMS IN COMMUNITY COLLEGES IN OCCUPATIONAL CLUSTERS

- | | |
|--|--|
| Agriculture. | 1. Farm Equipment Service |
| | 2. Forestry Aide |
| | 3. Landscaping -Ground Maintenance |
| | 4. Livestock Technology |
| | 5. Dairy Technology |
| | 6. Horticulture & Floriculture |
| | 7. Feed, Seed and Fertilizers |
|
Business (Marketing & Distribution. |
1. Business Mid-Management |
| | 2. Real Estate & Insurance |
| | 3. Retail Sales, Purchasing & Merchandising |
| | 4. Transportation & Traffic Management |
| | 5. Hotel-Motel Management |
|
Construction |
1. Surveying |
| | 2. Structural Engineering Technology |
| | 3. Civil Engineering Technology |
| | 4. Highway Engineering Technology |
| | 5. Architectural Technology |
| | 6. Building Construction Technology |
| | 7. Carpentry |
| | 8. Building Maintenance |

Chart II (Cont.)

Electricity-Electronics.	1. Electronic Engineering Technology
	2. Radio & Television Servicing
	3. Communications Technology
	4. Industrial Electronics
	5. Appliance Repair
	6. Electronic Mechanics
Food Service	1. Baking
	2. Institutional Cookery
	3. Food Processing Technology
	4. Cooks & Chefs Training
Health	1. Dental Assisting
	2. Dental Laboratory Technology
	3. Medical Assisting
	4. Practical Nursing
	5. X-Ray Technology
	6. Medical Laboratory Assisting
	7. Physical Therapy Assistant
	8. Sanitation Technology
Mechanical	1. Airframe & Power Plant Mechanic
	2. Industrial Technology
	3. Automotive Mechanics
	4. Diesel Technology
	5. Automotive Body Repair
	6. Marine Technology
	7. Automotive Tune-up & Instrumentation Technology
	8. Office Machines Technology
	9. Heavy Equipment Technology
	10. Hydraulics Technology
Metal Working.	1. Machine Tool Technology
	2. Welding Technology
	3. Machine Shop
	4. Metallurgical Technology
Office (Clerical, Stenographic, Bookkeeping & Accounting)	1. Library Aide
	2. Instructional Materials Technology
	3. Clerk-Typist
	4. File Clerk
	5. Data Processing Clerk

Chart II (Cont.)

Office (Cont.).	6. Sales Clerk
	7. Legal Secretary
	8. Secretary - Medical or Dental
	9. Stenographer
	10. Bookkeeper
	11. Data Processing Programs
Wood Products	1. Forest Product Technology
	2. Pulp & Paper Technology
	3. Forest Technician
	4. Chemical Technology
Graphics.	1. Machine Design
	2. Technical Drafting
	3. Publications Technician
	4. Commercial Art Technician
	5. Graphic Arts Technology

Generally, the accepted practice in the articulation of vocational programs between the high school and community college is left to the students' personal interests. A student selects a vocational program on the basis of interest and in some schools by aptitude tests. No specific courses are established for entry into a community college vocational curriculum.

In the guidance and counseling of students for admissions to community college vocational curriculums, consideration is given to placement in programs that the student may have successfully experienced in high school. A student planning to enter a machine shop or mechanic course need not have had previous courses to enter these programs. Also a student who may have previously taken machine shop or auto mechanics would not necessarily be given credit for this study in the community college. Articulation and due consideration for previous courses or vocational preparation needs to be more clearly defined for entry to such courses.

In engineering technology community college course. articulation is more clearly defined. A student planning to enter the technical courses is usually required to have taken algebra and possibly some trigonometry along with basic physics. Even though pre-requisites are more clearly defined in the technical courses, a considerable amount of overlapping is experienced in the mathematics and physical science courses. This overlap should be articulated with waiver of courses or advanced credit for courses taken in high school which are similar to some of the community college courses.

Courses which may overlap in the community college and high school and need articulation are:

CHART III

SIMILAR OCCUPATION COURSES OFFERED IN HIGH SCHOOLS AND COMMUNITY COLLEGES

Auto Mechanics	Retail Selling
Machine Shop	Business Mathematics
Basic Physical Science	Algebra
Typing & Shorthand	Trigonometry
Basic Woodworking	Physics
Drafting	Electrical Theory
Electrical-Electronic Theory	Electronic Theory
Food Preparation	Office Practice
First Aid	Business Machines
Office Procedures	Bookkeeping
Botany & Wood Products	Welding

As is often the case in education, we find ourselves going over the same ground again and again only to lose student interest and waste student and instructor time. It is incumbent on occupational educators to examine

more carefully this overlap. Such overlapping can only place education open to criticism from the student, business, industry and the tax supporting public for inefficient expenditure of educational effort.

As occupational programs are begun and expanded in the high school, programs in the community colleges will undergo change. Some basic fundamental courses, and in some cases, complete curriculums, will be dropped. More engineering technology programs and curriculums requiring high school preparatory study will develop. Also programs requiring costly outlay for equipment and laboratories which would be difficult to finance and justify in high schools, will become the expected service of a community college.

Occupational programs in the community college must offer education and training that adequately prepare students for employment. As an "open door" institution, the college must plan quality programs which will place students on the job to justify the existence of any program.

SECTION TWO

OCCUPATIONAL EDUCATION IN CLACKAMAS COUNTY

Vocational Guidance in Clackamas County.

1. Planning student programs for occupational objectives.

Expansion of vocational education in high schools and community colleges has placed increasing emphasis on guidance for occupational objectives. Without adequate guidance the expanded vocational programs would be of little value. Vocational Courses have been added in the high school to offer other choices to the student than college preparatory education. To determine what planning has been made for students in high schools of Clackamas County the survey interviews asked for specific information on vocational guidance. The following Table (Table 13) reports the present situation.

2. Vocationally oriented exploratory courses offered in high schools of Clackamas County.

Vocational counselors in the high school are the prime movers for the student's articulation of exploratory courses with vocational courses. With the many devices and techniques which the counselor may use for student career guidance none is more helpful than exploratory courses. The student should be given an opportunity to try more than one occupationally oriented exploratory course. The following Table (Table 14) gives some indication of the exploratory courses available to high school students in Clackamas County.

Table 13

VOCATIONAL GUIDANCE IN CLACKAMAS COUNTY HIGH SCHOOLS

1. Guidance given all students in the selection of career field on basis of exploratory pre-vocational course.	Yes 11	No 1
2. Provision made for student contact with person knowledgeable in selected field before selection of career field.	Yes 8	No 4
3. A written vocational study and training program is prepared for those planning career fields upon completion of high school.	Yes 8	No 3
4. Individual guidance is provided in planning vocation education programs beyond high school.	Yes 10	No 2

**PRE-OCCUPATIONAL (EXPLORATORY) COURSES OFFERED IN
Table 14 - HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS**

Course	No. Schools Offering	Grade Level				Total Class Hrs.	Pre-Occ. to High School Courses	Pre-Occ. to Comm. Coll. Courses	Pre-Occ. for Univ. Courses
		Course							
		9	10	11	12				
<u>Agricultural</u>									
Modern Concepts in Agriculture	5	5				5	5	5	5
Agricultural Science	4		4			4	4	4	4
Agriculture I	1	1				1	1	1	1
Farm Machine Assembly	1			1	1	1	1	1	1
Power Mechanica	1			1	1	1	1	1	1
Forestry	1		1	1	1	1	1	1	1
General Shop	1	1				1	1	1	1
Biology	1		1			1	1	1	1
<u>Business (Marketing & Distribution)</u>									
General Business	3	2	2	2	2	12	3	2	2
Distributive Education I	3			3		3	3	3	3
Journalism I	1	1	1	1	1	1	1	1	1
<u>Construction</u>									
Construction Skills	1			1	1	1	1	1	1
General Shop	3	3	3	2	2	3	3	3	3
General Shop II	1		1	1	1	1	1	1	1
Woodworking I	3	1	2	1	1	3	3	2	1
Woodworking II	6		5	2	1	6	6	5	5
Woodworking III	4			3	1	4	4	4	3
Machine Woodworking	1			1		1	1		
Industrial Arts Survey	4	4				4	4	4	4
Mechanical Drawing I	2	2	2	2	2	2	2	2	1
Mechanical Drawing II	4		4	1	1	4	4	4	4
Industrial Ed. I	1	1				1	1		

Table 14 (Cont.) - PRE-OCCUPATIONAL (EXPLORATORY) COURSES OFFERED IN
HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs.				Pre-Occ. to High School Courses		Pre-Occ. to Comm. Coll. Courses		Pre-Occ. for Univ. Courses
		9	10	11	12	90	180	360	540					
<u>Electrical-Electronic</u>														
General Shop	1	1	1			1				1		1		1
Basic Electricity & Electronics	1		1	1	1	1				1		1		1
Electronics I (AC-DC)	3	1	1	3	3	3				3		2		1
Electricity (AC-DC)	1		1	1	1	1				1				
Physical Science	4	4				4				4		4		4
<u>Food Service</u>														
Home Economics I	8	8	1	1	1	8				8		6		6
Home Economics II	7	1	6	1	1	7				7		5		5
Home Economics III	5			5		5				5		3		3
Home Economics IV	5				5	5				5		3		3
Family Meals	1		1	1	1				1	1				
Family Clothing	1		1	1	1				1	1				
Clothing-Formal Occ.	1		1	1	1				1	1				
Home Furnishings	1		1	1	1				1	1				
Family Living & Child Dev.	1		1	1	1				1	1				
Specialties in Food	1		1	1	1				1	1				
<u>Health</u>														
Homemaking I	8	8	2	2	2	8				8		8		7
Homemaking II	6	1	6	1	1	6				6		6		6
Homemaking III	4			4		4				4		4		4
Homemaking IV	4				4	4				4		4		4
Family Living & Child Dev.	1		1	1	1				1	1				
Health	1		1	1					1	1		1		1
Health III	1			1					1	1				

Table 14 (Cont.) - PRE-OCCUPATIONAL (EXPLORATORY) COURSES OFFERED IN
HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs.	Pre-Occ. to High School Courses		Pre-Occ. to Comm. Coll. Courses		Pre-Occ. for Univ. Courses
		9	10	11	12		90	180	360	540	
Health IV	1		1			1	1		1		
Physical Education	1	1	1			1	1		1		1
Biology	1		1			1	1		1		1
Health Career Club	1						(no credit given)				
Mechanical											
General Shop	1	1	1			1	1		1		1
Power Mechanics	1		1	2		1	1		1		1
Industrial Arts Survey	4	4				4	4		4		4
Mechanical Drawing II	1		1			1	1		1		1
Metal Work II	3		3			3	3		3		3
Metal Work III	3			3		3	3		3		3
Industrial Education I	1	1				1					
Metal Working Occupations											
Industrial Arts	4	4				4	4		4		4
Metal Work I	1		1			1	1		1		
Metal Work II	8		4	4		8	8		7		7
Metal Work III	1				1	1	1		1		1
General Shop	2	2	2	1	1	2	2		2		2
General Metals	1		1	1	1	1	1		1		1
Crafts	1		1	1	1	1	1		1		1
Exploratory Metals	1					1	1		1		1
Industrial Education	1	1				1	1		1		
Mechanical Drawing II	3		3			3	3		3		3

Table 14 (Cont.) - PRE-OCCUPATIONAL (EXPLORATORY) COURSES OFFERED IN
HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Courses	No. Schools Offering Course	Grade Level				Total Class Hrs. 90 180 360 540	Pre-Occ. to High School Courses		Pre-Occ. to Comm. Coll. Courses		Pre-Occ. for Univ. Courses	
		9	10	11	12		Courses		Courses		Courses	
<u>Office Occupations</u>												
Business Law	4			1	4	3	1	4	4		4	
Business Organization	3				3	3		3	3		3	
General Business	3	1	3	3	3	1	1	3	2		2	
Typing I	3	2	3	3	3	1	3		2		2	
Bookkeeping I	1		1	1	1		1		1		1	
Commercial Law	1			1	1		1		1		1	
Personal Typing	1		1	1	1	1			1		1	
Personal Record Keeping	1		1	1	1	1			1		1	
Practical Law	1			1	1	1			1		1	
<u>Wood Products Occupations</u>												
Conservation	1			1	1		1	1	1		1	
Woodworking I	2		1	1	1		2	2	2		2	
Woodworking II	3											
Woodworking III	3											
Industrial Arts	3											
Industrial Education I	1	1					1	1	1		1	
General Shop	1	1	1				1	1	1		1	
Forestry	1			1	1		1	1	1		1	

Table 14 (Cont.) - PRE-OCCUPATIONAL (EXPLORATORY) COURSES OFFERED IN
HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs.				Pre-Occ. to High School Courses		Pre-Occ. to Comm. Coll. for Univ. Courses	
		9 10 11 12				90 180 360 540							
		9	10	11	12	90	180	360	540				
<u>Graphics</u>													
Drafting	4	2	3	4	3	3	1		4	3		4	
Basic Drafting	1	1			1								
Art I	1		1		1				1	1		1	
Art II	1			1	1				1	1		1	
<u>Other</u>													
Homemaking I	3	3			3				3	3		3	
Homemaking II	3		3		3				3	3		3	
Journalism	3												
Stagecraft	3												

Vocational-Technical Courses Offered in High Schools in Clackamas County.

Increasing interest in vocational education has brought about an expansion of course offerings. The courses now being offered are basically in the traditional groups--agriculture, homemaking, industrial, business and distributive. The developing concept of job clusters is requiring a re-evaluation of course offerings on a pattern of families of job clusters. The courses as offered in the high schools of Clackamas County have been clustered to meet the new concept of families of occupational opportunities. (Table 15)

On-the-Job Training Given as Part of the High School Vocational Programming

On-the-job training as offered in the high schools of Clackamas County are limited. Many of these programs have grown in an unplanned manner. Tie-in of pre-vocational and general education courses to the job training has been limited. The following Table indicates the programs now being given. (Table 16)

Occupational Curriculum Expansion Planned for the Next 5 to 10 Years by High Schools in Clackamas County

The present trend of increasing interest in vocational education on local, state and national levels has required extensive planning for addition of new courses. In keeping with the new concept of grouping vocational courses in families of related occupations, or job clusters, the following proposed courses are being planned by various high schools. Some school officials indicated that other courses are being planned pending completion of present studies. (Table 17)

Table 15 - OCCUPATIONALLY ORIENTED COURSES OFFERED IN HIGH
SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering	Grade Level					Total Class Hrs.	Prep. for Job Entry	Prep. for Comm. College	Prep. for Univ.
		9 10 11 12								
		90	180	360	540					
<u>Agriculture</u>										
Crop Production	1	1	1	1		1	1	1	1	1
Livestock Production	1	1	1	1		1	1	1	1	1
Animal Nutrition, Genetics & Disease	1		1	1		1	1	1	1	1
Plant Propagation & Soils	1		1	1		1	1	1	1	1
Farm Management & Agriculture										
Business	2			2		1	1	2	2	2
Farm Machine Assembly	1		1	1		1		1	1	1
Agriculture Horticulture	1		1	1		1		1	1	1
Agriculture Resources	1		1	1		1		1	1	1
Agriculture Technology & Production	2		1	2	2		2	2	2	2
Agriculture Machinery	3		1	2	3	1	2	3	3	2
Agriculture I	1		1				1	1	1	1
Agriculture II	2		1	1			1	2	2	1
Agriculture III	2		1		1		2	2	2	1
Agriculture IV	1		1				1	1	1	1
Forestry	1				1	1		1	1	1
Landscape & Horticulture I	1			1	1	1		1	1	1
Landscape & Horticulture II	1			1	1	1		1	1	1
Agriculture Supply & Finance	1				1	1		1	1	1
Modern Agricultural Concepts	1		1	1	1		1	1	1	1
Landscape, Gardening & Greenhouse	1		1	1	1					
Agriculture Shop	1		1	1	1					

* One school at 720 hours

Table 15 (Cont.) - OCCUPATIONALLY ORIENTED COURSES OFFERED IN HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs.				Prep. for Job Entry	Prep. for Comm. College	Prep. for Univ.
		Level				Class Hrs.						
		9	10	11	12	90	180	360	540			
<u>Business (Marketing & Distribution)</u>												
Distributive Education I	3	1	2	3		2	1			3	3	2
Distributive Education II	4		1	4		3			*	4	4	1
Journalism II	1	1	1	1		1				1	1	1
<u>Construction</u>												
Woodworking II	2	1	2	2		1	1			2	2	2
Woodworking III	2		1	1		2				2	2	2
Building Construction I	1		1				1			1	1	
Building Construction II	1			1					1	1	1	
Mechanical Drawing III	4		4	1		3	1			4	4	4
Mechanical Drawing IV	3			3		3				3	3	3
Shop III	1		1	1		1				1	1	1
Furniture Production	1		1	1		1	1			1	1	
Carpentry & Materials Research	1		1	1		1				1	1	1
<u>Electrical-Electronics</u>												
Electrical-Electronics I	1		1				1			1	1	
Electrical-Electronics II	2		1	1	2	1			1	2	2	1
Solid State Electronics	1		1	1		1				1	1	1

* One school at 720 hours

Table 15 (Cont.) - OCCUPATIONALLY ORIENTED COURSES OFFERED IN HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs.				Prep. for Comm. College	Prep. for Univ.	
		Level				Class Hrs.						
		9	10	11	12	90	180	360	540			
<u>Food Service</u>												
Food Preparation	1		1	1	1		1			1	1	
Homemaking I	1	1				1				1	1	
Homemaking II	2		2	1	1		1			2	2	
Homemaking III	2			2	1		1			2	2	
Homemaking IV	2				2		1			2	2	
Dress Design	1		1	1	1					1		
<u>Health</u>												
Child Services I	1		1				1			1		
Child Services II	1			1				1		1		
Homemaking I	1	1					1			1	1	
Homemaking II	1		1				1			1	1	
Homemaking III	1			1			1			1	1	
Sr. Homemaking	1				1			1		1	1	
<u>Mechanical</u>												
Auto Mechanics	3		1	2	3		1		1*	3	2	
Power Mechanics	1			1	1		1			1	1	
Industrial Mechanics I	1			1				1		1		
Industrial Mechanics II	1				1				1	1		

* One school at 2160 hours: 3 shop hrs. per day for 1080 hrs. per year for two years

Table 15 (Cont.) - OCCUPATIONALLY ORIENTED COURSES OFFERED IN HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Course	Grade Level				Total Class Hrs				Prep. for Comm. College	Prep. for Univ.
		Level				Class Hrs					
		9	10	11	12	90	180	360	540		
<u>Metal Working</u>											
Metal Working I	1		1				1		1		
Metal Working II	1			1				1	1		
Beginning Metal Technology	1		1	1			1		1		1
Machine Shop	2		2	2				2*	2		2
Auto Body	2		2	2				2	2		2
<u>Office</u>											
Typing I	8	3	8	3	3	7	1		8		8
Typing II	8	1	2	7	5	6	1		8		8
Shorthand I	11		1	11	7	10	1		11		11
Shorthand II	9			2	9	8	1		9		9
Bookkeeping I	10		1	10	9	9	1		10		10
Bookkeeping II	3			1	3	3			3		3
Office Practice	5		1	2	5	4	1		5		5
Business Law	1			1		1			1		1
Business Machines & Office Prac.	1				1	1			1		1
Transcription & Office Prac.	4				4	3	1		4		4
Clerical Practice	4			1	4	3	1		4		4
Library Practice	1		1	1	1	1			1		1

* One school at 2160 hours: 3 shop hrs. per day for 1080 hrs. per year for two years

Table 15 (Cont.) - OCCUPATIONALLY ORIENTED COURSES OFFERED IN HIGH SCHOOLS IN CLACKAMAS COUNTY BY CLUSTERS

Course	No. Schools Offering Courses	Grade Level				Total Class Hrs.				Prep. for Job Entry	Prep. for Comm. College	Prep. for Univ..
		9	10	11	12	90	180	360	540			
<u>Wood Products</u>												
Machine Woodworking	1	1	1	1		1			1			
Agriculture IV (Forestry)	1		1	1		1			1	1		1
<u>Graphics</u>												
Graphic Reproduction I	1	1					1			1		
Graphic Reproduction II	1		1					1	1	1		
Drafting & Design I	1	1					1			1		
Drafting & Design II	4	2	3	4		2	1	1	4	4		3
Drafting III	2	1	1	2		1	1		2	2		2
Engineering Drafting	1	1	1	1		1			1	1		1
Architectural Drafting	1	1	1	1		1			1	1		1
Drafting Research & Development	1			1		1			1	1		1
Photography	1	1	1	1					1	1		1

BLANK INSERT

Table 16 - ON-THE-JOB TRAINING OFFERED AS PART OF HIGH SCHOOL
PROGRAMS IN CLACKANAS COUNTY

Course	No. Schools Offering Course	Grade Level				Work Hrs. School Year	Job Entry	College Entry	
		Level							
		9	10	11	12				
<u>Agriculture</u>									
Agriculture Work Experience	4	3	3	1	1		1	3	
On-Farm Projects	2	1	1	2	1		1	1	
On-Job Work Projects	1	1	1	1			1	1	
Agriculture-Business	1				1	360	1	1	
<u>Business (Marketing & Distribution)</u>									
Distributive Education	4		3	4		180	1	1	
Distributive Education II	2		1	2	1	360	2	2	
<u>Construction</u>									
Woodworking Assistant	1			1		180	1	1	
<u>Electrical-Electronics</u>									
Electrical-Electronics Assistant	1			1		180	1	1	

Table 16 (Cont.) - ON-THE-JOB TRAINING OFFERED AS PART OF HIGH SCHOOL
PROGRAMS IN CLACKAMAS COUNTY

Course	No. Schools Offering Course	Grade Level				Work Hrs. School Year	Job Entry	College Entry
		9	10	11	12			
<u>Food Service</u>								
Cafeteria Work	2							
Distributive Education-Waitress Training	1		1	1		1440	1	1
<u>Health</u>								
Homemaking I	1	1				180	1	1
Homemaking II	1		1			180	1	1
Homemaking III	1			1		180	1	1
Sr. Homemaking	1				1	180	1	1
Child Services I	1		1			360	1	1
Child Services II	1			1		540	1	1
<u>Mechanical</u>								
None								
<u>Metal Working</u>								
None								
<u>Office</u>								
Office Work Experience	7		1	4	6	1 90	6	6
						2 180		
						2 360		

Table 16 (Cont.) - ON-THE-JOB TRAINING OFFERED AS PART OF HIGH SCHOOL
PROGRAMS IN CLACKAMAS COUNTY

<u>Course</u>	<u>No. Schools Offering Course</u>	<u>Grade Level</u> <u>9 10 11 12</u>	<u>Work Hrs. School Year</u>	<u>Job Entry</u>	<u>College Entry</u>
<u>Wood Products</u>					
Forest Lab	1	In conjunction with Forestry Class			
<u>Graphics</u>					
None					
<u>Other</u>					
Work Experience	2	Sewing at Pendleton Woolen Mills			

Table 17 - OCCUPATIONALLY ORIENTED COURSE EXPANSION PLANNED FOR HIGH SCHOOLS
IN CLACKAMAS COUNTY DURING NEXT 5 to 10 YEARS

Course	No.		Comm. Col. Prep.	University Prep.
	High Schools Offering Course	High Schools Plan to Add Courses		
<u>Agriculture</u>				
Distribution & Management	None	1	1	1
<u>Business (Marketing & Distribution)</u>				
Salesmanship	None	1	1	1
Marketing	None	1	1	1
<u>Construction</u>				
Carpentry	1	1	1	1
<u>Electrical-Electronics</u>				
Electronics	2	2	1	1
DC Circuit Principles & Analysis	None	1	1	1
AC Principles & Analysis	None	1	1	1
Electron Tubes & Solid State Devices	1	1	1	1
Industrial Controls & Instruments	None	1	1	1
<u>Food Services</u>				
Homemaking	2	1	1	1

Table 17 (Cont.) - OCCUPATIONALLY ORIENTED COURSE EXPANSION PLANNED FOR HIGH SCHOOLS
IN CLACKAMAS COUNTY DURING NEXT 5 TO 10 YEARS

<u>Course</u>	<u>No.</u> <u>High Schools</u> <u>Offering Course</u>	<u>No.</u> <u>High Schools</u> <u>Plan to</u> <u>Add Courses</u>	<u>Comm. Col.</u> <u>Prep.</u>	<u>University</u> <u>Prep.</u>
<u>Health</u>				
None				
<u>Mechanical</u>				
Internal Combustion Engines	None	1	1	1
Hydraulics & Pneumatics	None	1	1	1
Power Transmission & Mechanical Linkage	None	1	1	1
Power Mechanics	1	1	1	1
Auto Mechanics	3	1	1	1
<u>Metal Working</u>				
Basic Metal Working Practices & Machines	None	1	1	1
Machining & Forming Techniques	None	1	1	1
Materials & Metal Processing	None	1	1	1
Fabrication & Production Techniques	None	1	1	1
Metal Working	1	1	1	1
Machine Shop	2	1	1	1
<u>Office</u>				
Data Processing	None	1	1	1
Business Machines	1	1	1	1
Accounting	None	1	1	1

Table 17 (Cont.) - OCCUPATIONALLY ORIENTED COURSE EXPANSION PLANNED FOR HIGH SCHOOLS
IN CLACKAMAS COUNTY DURING NEXT 5 TO 10 YEARS

<u>Course</u>	<u>No.</u>		<u>No.</u>		<u>University</u>	
	<u>High Schools</u>	<u>Offering Course</u>	<u>High Schools</u>	<u>Plan to Add Courses</u>	<u>Comm. Col. Prep.</u>	<u>Prep.</u>
<u>Wood Products</u>						
None						
<u>Graphics</u>						
Drafting III	2		1		1	1
Engineering Graphics	None		1		1	1
Commercial Art	None		1		1	1

Occupational Education at Clackamas Community College

1. Curriculums being offered.

Clackamas Community College began its first year of full time operation in the school year 1967-68. A limited number of curriculums are offered due to budget curtailment. Two budget defeats during the spring and summer required the elimination of the planned electronic curriculum and restrictions on other newly planned programs. The following programs represent the beginning of comprehensive, full-time occupational curriculums. (Chart IV)

2. Additional occupational curriculums suggested for Clackamas Community College.

Employment opportunities in Clackamas County and the Greater Portland Area have indicated a need for occupational education in various curriculums. Tentative proposals will include a gradual expansion of occupational education by the addition of a few programs every year for the next five to ten years. Chart V, pg. 49, shows curriculums which are being considered.

Chart IV - OCCUPATIONAL CURRICULUMS AT CLACKAMAS
COMMUNITY COLLEGE - 1967-68

<u>Curriculum</u>	<u>Length Curriculum</u>	<u>Pre-Voc. Courses Helpful (Yes-No)</u>	<u>Pre-Voc. Courses Essential (Yes-No)</u>	<u>Prep. for Job Entry</u>	<u>University Prep.</u>
<u>Full Time Programs</u>					
Auto Body & Fender Repair	6 qtrs.	Yes	No	Yes	No
Auto Mechanics	6 qtrs.	Yes	No	Yes	No
Drafting Technology	6 qtrs.	Yes	No	Yes	Helpful
Office Clerical-Bookkeeping	3 qtrs.	Yes	No	Yes	Helpful
Practical Nursing	3 qtrs.	Yes	No	Yes	No
Machine Technology	6 qtrs.	Yes	No	Yes	No
Secretarial	3 qtrs.	Yes	No	Yes	Helpful
Welding Technology	3 qtrs.	Yes	No	Yes	No
<u>Short Term Programs</u>					
Home Health Aid	8 wks.	Yes	No	Yes	No
Library Aid (Clerical)	4 wks.	Yes	Yes	Yes	Helpful
<u>Selected Courses from Following Programs</u>					
Law Enforcement	6 qtrs.	Yes	No	Yes	Helpful
Fire Protection	6 qtrs.	Yes	No	Yes	No

Chart V - ADDITIONAL OCCUPATIONAL CURRICULUMS SUGGESTED FOR
CLACKAMAS COMMUNITY COLLEGE DURING NEXT 5 TO 10 YEARS

<u>Curriculum</u>	<u>Length</u> <u>Curriculum</u>	<u>Pre-Voc.</u> <u>Courses</u> <u>Helpful</u> <u>(Yes-No)</u>	<u>Pre-Voc.</u> <u>Courses</u> <u>Essential</u> <u>(Yes-No)</u>	<u>Prep. for</u> <u>Job Entry</u>	<u>University</u> <u>Prep.</u>
Electronics Technology	6 qtrs.	Yes	Yes	Yes	Helpful
Business-Merchandising	6 qtrs.	Yes	No	Yes	Helpful
Secretarial Science	6 qtrs.	Yes	No	Yes	Helpful
Second year options in					
Legal, Medical, or Executive					
Farm Equipment Service	6 qtrs.	Yes	No	Yes	No
Construction Technology	6 qtrs.	Yes	No	Yes	Helpful
Building Maintenance	3 qtrs.	Yes	No	Yes	No
Dental Assisting	4 qtrs.	Yes	No	Yes	No
Diesel Technology	7 qtrs.	Yes	Yes	Yes	No
Marine Engine Mechanic	7 qtrs.	Yes	No	Yes	No
Hydraulics Mechanic	6 qtrs.	Yes	No	Yes	No
Business Data Processing	6 qtrs.	Yes	Yes	Yes	Helpful
Pulp & Paper Technology	6 qtrs.	Yes	No	Yes	Helpful
Commercial Art Technology	6 qtrs.	Yes	No	Yes	Helpful

Section III

SUMMARY & CONCLUSIONS

Occupational Opportunities in Clackamas County and the Greater Portland Area

The Study of Technical Vocational Education for High School Students in Clackamas County, 1965, emphasized the need for expanded vocational technical education in Clackamas County. Employers interviewed in this study suggested many subject areas which should be offered in the public schools. No attempt was made to delineate what should be given in high school or post high school. Some of the suggestions included subjects such as those given engineering technician students. Such study would require preparatory courses in math and science which would normally be given in the high school. The engineering technician subject matter would logically follow in the post high school years.

This study pointed out the need for development of certain basic skills in school shop or business classes before job entry. Many of the basic functions, knowledge, and skills which were recommended are common to various jobs. The need for planning occupational education in job clusters was evident. The study also suggested subject matter without indication of need for articulation at different educational levels.

The Oregon State Department of Employment in its study, Technological Change and Its Impaction--The Oregon Labor Force, 1966, points out the expanding needs for qualified persons in many occupational areas requiring less than a baccalaureate degree.

Jobs for which occupational education and training might be provided in the high school or community college were selected by occupational clusters. The clusters as identified were those that have been suggested by the State Department of Education and The Job Cluster Curriculum, Lane County Study of 1965, and the present study, namely:

- | | |
|--|---|
| 1. Agriculture | 7. Mechanical |
| 2. Business (Marketing & Distribution) | 8. Metal Working |
| 3. Construction | 9. Office (Secretarial, Book-keeping, Clerical) |
| 4. Electrical-Electronic | 10. Food Products |
| 5. Food Service | 11. Graphics |
| 6. Health | 12. Government |

It is evident from the anticipated needs for additional workers for the period 1966-69 that the greatest demand will be in the business area. It is anticipated that over eight thousand additional workers will be needed in business. Second in order of job openings is the office occupational area in which there will be openings for approximately six thousand persons. The other occupational clusters would be ranked as follows:

- | | |
|--------------------|-----------------------------|
| 3rd, Metal Working | 8th, Government Service |
| 4th, Food Services | 9th, Graphics |
| 5th, Construction | 10th, Wood Products |
| 6th, Health | 11th, Agriculture |
| 7th, Mechanical | 12th, Electrical-Electronic |

The indicated needs shown by the Greater Portland Area study would suggest that schools should analyze carefully their programs to determine whether the courses offered in any one program or curriculum are proportionate to the needs of business and industry.

Articulating Occupational Education for Job Clusters.

From information obtained from the studies which have been made, it is

obvious that common knowledge, skills and information for families of jobs should be articulated in planning curriculums and in guiding students in their studies. Too many times individual occupational courses have been set up to develop a particular skill without reference to a goal such as an occupational career field.

In such a well-known job field as represented by office occupations, courses such as typing, business machines, bookkeeping, business law, business english and others are common job preparatory courses. In like manner, persons planning to enter various mechanical fields in the mechanic occupational clusters would have common basic courses such as industrial mechanical, internal combustion engines, hydraulics, electricity and others. In planning curriculums on the job cluster basis it is essential that articulation be made by the various instructional areas and the post high school educational institutions, if additional occupational training is needed beyond the high school level. Consideration needs to be given to identification of the curriculum requirements in the community college which would be on-going occupational education in more depth for programs begun in high school.

Occupational Guidance for Better Articulation

The survey of high school occupational guidance brought out the importance attached to careful selection of career fields on the basis of exploratory pre-vocational courses. The results of the survey also suggested that written vocational education and training programs should be prepared for those planning to enter occupational fields requiring less than a baccalaureate degree. The study further suggested that individual guidance should

be provided for students selecting occupational fields which required post high school occupational education to articulate the high school courses with the selected occupation.

The survey of high schools in Clackamas County indicated a variety of occupational exploratory courses being offered in most high schools. These courses were offered in most instances as one year courses of one hour per day. In most instances these courses could be taken electively anywhere from the 9th to the 12th grades. The major emphasis appeared to be given in the 9th, 10th and 11th grades. These courses were offered as both pre-vocational to high school vocational offerings and post high school occupational course offerings. A fairly broad offering of exploratory courses were indicated in all of the occupational clusters with the exception of business (marketing and distribution), electrical-electronic and graphics.

Occupational Education Offered in Clackamas County.

Occupational courses offered in the high schools of Clackamas County area served by the Clackamas Community College, were somewhat limited. From a study of the answers to the questionnaire, it is evident that many of the schools offered a selection of office-type courses. Some offered vocational agricultural courses. There was a considerable lack of offerings in the other job clusters. The random offering of courses in other areas did not appear to be articulated with occupational goals or job clusters. A developing pattern of occupational course offerings directed more toward the job cluster concept is evident in the Milwaukie Occupational Skill Center and West Linn High School.

The occupational curriculum expansion as planned for the high schools in Clackamas County are being directed towards a broader offering in occupational clustered courses. It is obvious from the courses involved in developing occupational clustered programs that much planning will need to be done to articulate courses. The study indicates need for education and training in the business (marketing and distribution) cluster, but none is indicated. It is obvious from the lack of planning for additional courses in areas where there is a distinct need that some coordination and planning should develop between the high schools and the community college.

Occupational education being offered at the Clackamas Community College during its first year of full time operation (67-68) has comprehensive programs which need to be articulated with the high school occupational courses. The study points out that some of the community college curriculums overlap some course work given in the high schools. Curriculums such as drafting, office clerk, machine technology, secretarial, and welding involve some duplication of basic course work at both levels. An articulated plan of evaluation and granting of credits or waiver of basic courses needs to be made. The curriculums which may be added to the Clackamas Community College program offerings during the next five to ten years should include involved programs that will require some preparatory course work in the high school. Adequate planning will need to be made to articulate the two levels, particularly in the following areas: electronics, business (merchandising), secretarial science in the legal, medical and executive options,

instruction technology, diesel technology, hydraulics mechanics, and possibly business data processing.

In considering the high school vocational technical courses and the community college occupational curriculums being offered at present, along with the projected additions, it is obvious that some intensive study by job cluster areas will need to be done by the high schools and community college to better articulate course offerings.

Section IV

RECOMMENDATIONS

Any research study suggests many ideas for improvement, or innovation, which become obvious as a knowledgeable person studies the findings and conclusions. A research study is of little use unless action follows to remedy problem conditions noted.

To improve articulation between the high schools and community college a funded, on-going project should be provided to analyze occupational course offerings in high schools and the community college in Clackamas County to--

1. determine which occupational courses should be given in both high school and community college and to standardize course content in subjects such as typing, shorthand, drafting and similar courses which are basic for occupational preparation.
2. determine whether or not certain occupational courses should be given only in the high school or community college.
3. determine whether a gap exists between some community college curriculums and the high schools and identify course content to be given in the high school.
4. to determine which exploratory courses should be given in high schools not now offering pre-vocational experience

for the various occupational clusters.

5. to study and suggest cooperative planning between high schools, or high schools and the community college, to cooperatively offer selected occupational courses in centralized facilities to eliminate duplication of costly equipment and facilities.
6. to determine whether other occupational programs ~~should~~ be added because of employment needs in the Greater Portland Areas, which are not being adequately met. Such determination to be studied and coordinated with other schools offering occupational education in the Greater Portland Area.
7. to determine what community college courses might be given as advanced placement courses or for waiver of course either at the high school or community college.

Following analysis and study of recommendations by qualified consultant or consultants, a workshop should be planned for each occupational cluster. All high school teachers involved in occupational education, counselors, and community college occupational instructors should work together to plan implementation of suggestions developed through the workshop.

Office of Occupational Education
Date _____

Section I. GENERAL INFORMATION

1. High School _____ Sch. Dist. _____
2. Address _____ Phone _____
 (Street) _____
 (City) _____ Zip Code _____
3. Superintendent _____ Phone _____
4. Principal _____ Phone _____
5. Director, Supervisor or Coordinatory of Vocational Education
_____ Phone _____

5.11 Degree _____

5.12 Major _____

5.13 Minor _____

5.14 Certificate _____

5.21 Occupation _____

5.22 Yrs. experience (as trained worker) _____

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Section II. VOCATIONAL GUIDANCE

6. Is a planned vocational guidance program in operation to assist every student in selecting a career field on the basis of interests and aptitudes shown in pre-vocational exploratory courses? Yes ____ No ____ Comment: _____
7. Is there provision for student contact with persons who are knowledgeable about an occupation before planning a definite vocational program? Yes ____ No ____ Comment: _____
8. Is the student aided in planning a written vocational study and training program in high school vocational courses? Yes ____ No ____ Comment: _____
9. Are students guided individually in planning a definite vocational education program beyond high school, such as is offered in community colleges, technical schools, proprietary schools and apprenticeships? Yes ____ No ____ Comment: _____

Section III. PRE-VOCATIONAL AND VOCATIONAL COURSES (Exploratory)
(Include courses to be added next 3 to 5 years and place in parenthesis.)

10. Agricultural Occupations

10.1 Pre-vocational Courses

10.11

10.12

10.13

10.14

10.15

				Com.	
Grade No.	Total Credit	Job	Col.	Univ.	
<u>Level</u>	<u>Sem.</u>	<u>Hours</u>	<u>Units</u>	<u>Entry</u>	<u>Prep.</u>

10.2 Vocational Courses

10.21

10.22

10.23

10.24

10.25

				Com.	
Grade No.	Total Credit	Job	Col.	Univ.	
<u>Level</u>	<u>Sem.</u>	<u>Hours</u>	<u>Units</u>	<u>Entry</u>	<u>Prep.</u>

10.3 On the Job Work Experience Programs

10.31

10.32

				Com.	
Grade No.	Total Credit	Job	Col.	Univ.	
<u>Level</u>	<u>Sem.</u>	<u>Hours</u>	<u>Units</u>	<u>Entry</u>	<u>Prep.</u>

APPENDIX NOTE:

A separate questionnaire page similar to the previous page for Section III was included for each occupational cluster, namely:

11. Business (Marketing & Distribution)
12. Construction
13. Electrical-Electronics
14. Food Service
15. Health
16. Mechanical
17. Metal Working
18. Office (Secty, Bkkg.)
19. Wood Products
20. Graphics

Appendix B

CLACKAMAS COMMUNITY COLLEGE SECRETARIAL CURRICULUM WITH SUGGESTED ARTICULATION OF HIGH SCHOOL COURSES

<u>Community College Curriculum</u>	<u>* Similar High School Courses</u>
Typing I.	Typing I
Typing II	Typing II
Typing III.	None
Shorthand I	Shorthand I
Shorthand II	Shorthand II
Shorthand III	None
Office Procedures I	Office Practice
Office Procedures II & III	None
Business Communications I, II, III	None
Electives: (3 or more college level courses)	None

* Suggested evaluation for application to Clackamas Community College curriculum to be made by joint committee of community college and high schools in Clackamas County.

**CLACKAMAS COMMUNITY COLLEGE DRAFTING TECHNOLOGY
CURRICULUM (2 YRS.) WITH SUGGESTED ARTICULATION
OF HIGH SCHOOL COURSES**

<u>Community College Curriculum</u>	<u>* Similar High School Courses</u>
Drafting I & II	2nd Yr. Drafting
Intro. Fabrication Practices.	None
Project Drafting I.	3rd Yr. Drafting
Project Drafting II	None
Advanced Machine Drafting I	Engineering Drafting
Advanced Machine Drafting II & III.	None
Electrical Drafting	None
Production Planning.	None
Metals Application, Treatment & Testing.	None
Technical Illustration	None
Architectural Drafting	Architectural Drafting
Structural Drafting	None
Mathematics II.	Algebra
Mathematics III	Trigonometry
Mechanical Science.	Physics
Science of Heat, Sound & Light.	Physics
Electrical Science.	Electrical Theory
Communication Skills I & II	None
Applied Economics	None
Technical Report Writing.	None
Employer-Employee Relations	None
Applied Physics I, II & III	None
Engineering Problems I & II	None
Industrial Safety	None
Health.	None
Physical Education.	None

*Suggested evaluation for application to Clackamas Community College curriculum to be made by joint committee of community college and high schools in Clackamas County.

**SUGGESTED ARTICULATION OF HIGH SCHOOL OCCUPATIONAL
EXPLORATORY COURSES AND COMMUNITY COLLEGE CURRICULUM
IN CLACKAMAS COUNTY**

**High School
Exploratory Courses**

**Preparatory
for Community
College Curriculum**

Electrical-Electronic Cluster

General Shop (Including Electrical))	
Basic Electricity	)
Electronic I	) Electronic Technician
Physical Science	)
General Science	)

Health Cluster

Family Living	)
Child Development	)
Health	) Practical Nursing
Biology	)
Health Career Club	)

Mechanical Cluster

General Shop	)	
Power Mechanics	)	
Industrial Arts	)	
Mechanical Drawing	)	(Auto Mechanics
Metal Work	)	(Auto Body & Fender
Industrial Education)		(Machine Technology
General Metals	)	(Welding Technology
Crafts	)	
Exploratory Metal	)	

Office Cluster (Secty. & Bkkg.)

Typing	)	
Shorthand	)	
Bookkeeping	)	(Secretarial
Business Law	)	(Bookkeeping
General Business)		(Office Clerical
Record Keeping	)	

SUGGESTED ARTICULATION OF HIGH SCHOOL OCCUPATIONAL
EXPLORATORY COURSES AND COMMUNITY COLLEGE CURRICULUM
IN CLACKAMAS COUNTY

High School
Exploratory Courses

Preparatory
for Community
College Curriculum

Business (Marketing-Distribution) Cluster

General Business	)	
Distributive Education)		
Business Law	)	Business-Merchandising
Commercial Law	)	
Business Organization)		

Government (Public Service) Cluster

Modern Problems	)	
Social Studies	)	Law Enforcement
Occupational Psychology)		Fire Protection
U.S.Government	)	

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